

CLAIMS

What is claimed is:

1. A method for treating an area of a semiconductor wafer surface to reduce surface irregularities and stress concentrations, comprising:

treating the area with a laser, wherein the treated area is melted by a laser beam and re-solidifies into a more planar profile.
2. The method of claim 1, wherein the treated area is ablated by the laser beam, vaporizing at least a portion of the surface irregularities.
3. The method of claim 1, wherein the laser is a diode-pumped, charge-loaded laser.
4. The method of claim 3, wherein the laser is a soft-marking laser.
5. The method of claim 4, wherein the laser emits green laser light.
6. The method of claim 4, wherein the laser emits infrared laser light.
7. The method of claim 4, wherein the laser is selected from a set consisting of an Nd:YAG laser, a frequency-doubled Nd:YAG laser, an excimer laser, a helium-neon laser, and a carbon-dioxide laser.

8. A semiconductor wafer on which an area has been treated to reduce surface irregularities according to a method comprising:

treating the area with a laser, wherein the treated area is melted by a laser beam and re-solidifies into a more planar profile.

9. The wafer of claim 8, wherein the treated area is ablated by the laser beam, vaporizing at least a portion of the surface irregularities.

10. The wafer of claim 9, wherein the treated area is at least a portion of a scribe street, and wherein the scribe street has a width.

11. The method of claim 10, wherein the treated area has a width less than the width of the scribe street.

12. The method of claim 11, wherein the treated area has a width greater than a kerf created by a wafer dicing blade.

13. The wafer of claim 8, wherein the laser is a diode-pumped, charge-loaded laser.

14. The wafer of claim 13, wherein the laser is a soft-marking laser.

15. The wafer of claim 14, wherein the laser is selected from a set consisting of an Nd:YAG laser, a frequency-doubled Nd:YAG laser, an excimer laser, a helium-neon laser, and a carbon-dioxide laser

16. A method comprising:
- treating at least a portion of a scribe street on a semiconductor wafer surface, wherein the surface is melted and resolidifies into a more planar profile, thereby reducing stress concentrations on the surface; and
- sawing through the treated portion.
17. The method of claim 16, wherein the wafer surface is melted by a laser.
18. The method of claim 17, wherein the laser is a soft-marking laser.
19. The method of claim 18, wherein the laser is selected from a set consisting of an Nd:YAG laser, a frequency-doubled Nd:YAG laser, an excimer laser, a helium-neon laser, and a carbon-dioxide laser
20. The method of claim 16, wherein treating the wafer surface immediately precedes laser marking.
21. The method of claim 16, wherein treating the wafer surface immediately follows laser marking.
22. The method of claim 16, wherein the treated portion is on the active surface of the wafer.
23. The method of claim 16, wherein the treated portion is on the backside of the wafer.